Field pennycress (*Thlaspi arvense* L.) is a new oilseed crop in the Brassicaceae family related to canola (*B. juncea*) and rapeseed (*B. rapa* and *B. napus*). Unlike canola and rapeseed production, optimal production guidelines have yet to be established for pennycress. Planting density or seed rates can dramatically impact seed production and yields.

This study investigated the effect of plant density on specific flowering and seed production characteristics that directly relate to seed yield. A growth chamber experiment was conducted on a non-dormant spring pennycress line, ‘Spring 32’ at eight different plant densities of 1, 2, 3, 4, 5, 6, 8, and 9 plants per pot. Each pot soil measured 10 cm² and was replicated 5 times at a single fertilizer rate of 50lbs of nitrogen per acre. Plant height, filled and aborted pod number, pod diameter, number of seeds per pod, floral branching, plant tillering, and seed and biomass yield were all measured for each plant in each treatment.

The increase of plant density had a significant influence on all plant measurements except number of aborted fruits. The seed weight decreased significantly as plant numbers increased per pot, from 0.12g with one plant to 0.09g with nine plants. The mean weight of the total seed produced per pot increased from 1.3g to 1.7g as density increased.

Understanding the ideal planting density for pennycress to obtain optimal seed yields will further improve a producer’s ability to successfully grow and introduce this new crop into the Midwest.